Patent claims

1. An electric axial flow machine with an ironless disk-shaped rotor (1) which is arranged on a machine shaft (2) and has permanent magnets (11) which are embedded in a fiber- or fabric-reinforced plastic (12), and on both sides next to the rotor (1) in each case a stator (3, 4), characterized in that the permanent magnets (11) are each joined with a positive fit to the surrounding fiber- or fabric-reinforced plastic (12) and the latter, together with the permanent magnets (11) and the machine shaft (2), forms a dimensionally stable unit.

2. The electric axial flow machine as claimed in claim 1, characterized in that a plurality of permanent magnets (11) are arranged in a circular manner around the machine shaft (2) and the fiber- or fabric-reinforced plastic (12), in particular a thermosetting material, extends between the permanent magnets (11) altogether over at least 10%, preferably between 15% and 20%, of the circle.

3. The electric axial flow machine as claimed in claim 1 or 2, characterized in that the rotor (1) has on the outer circumference or in the vicinity of the outer circumference a stiffening band (13), which comprises preimpregnated fibrous material, which preferably contains glass, carbon or Kevlar fibers, and, for stiffening purposes, the rotor (1) is preferably formed such that it becomes thicker from the inside outward.

4. The electric axial flow machine as claimed in one of claims 1 to 3, characterized in that it has means for determining the magnetic pole position of

the rotor (1), which preferably comprise a magnetic strip (14) which is arranged on the outer circumference of the rotor (1) and forms a radially magnetized series of magnetic poles, which are respectively arranged in a way corresponding to the permanent magnets (11) embedded in the fiber- or fabric-reinforced plastic (12), and fixed-in-place Hall probes (5) interacting with said magnetic poles.

5. The electric axial flow machine as claimed in one of claims 1 to 4, characterized in that the fiber- or fabric-reinforced plastic (12) comprises an epoxy resin or an imide resin with glass fiber reinforcement and preferably, for better thermal expansion and thermal conductivity, additionally comprises mineral substances.

6. The electric axial flow machine as claimed in one of claims 1 to 5, characterized in that the permanent magnets (11) respectively comprise at least two separate magnet segments (111) next to one another in the circumferential direction, which are preferably joined by means of a metal adhesive.

7. The electric axial flow machine as claimed in one of claims 1 to 6, characterized in that the stators (3, 4) each comprise an annular yoke (31, 41), in which slots (32, 42) extending approximately radially from the inside outward have been made, through which slots multi-phase windings (33, 43) are led.

8. The electric axial flow machine as claimed in one of claims 1 to 7, characterized in that the permanent magnets (11) or the slots (32, 42) are transposed in the circumferential direction.

9. The electric axial flow machine as claimed in one of claims 1 to 8, characterized in that the two stators (3, 4) are electrically offset in relation to one another in the circumferential direction by 180°, with the result that the corresponding magnetic fluxes in the circumferential direction in the rotor (1) are oppositely oriented and consequently cancel one another out in practice, at least for the most part.

SUB A7 CONT'D.

10. A method for producing a rotor (1) for an electric axial flow machine as claimed in one of claims 1 to 9, characterized in that a machine shaft (2) and permanent magnets (11) are arranged in a mold and a pre-heated fiber- or fabric-reinforced plastic is subsequently poured under pressure into the mold, which is heated.

11. The method as claimed in claim 10, characterized in that the pouring-in of the fiber- or fabric-reinforced plastic takes place at a temperature of at least 200°C and under a pressure of 500 - 1500 bar.

ADD A8 (ABSTRACT)

Add > B6